SOIL SURVEY OF TAZEWELL COUNTY, ILLINOIS.

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LOCATION AND BOUNDARIES OF THE AREA.

Tazewell County, Ill., comprises an area of about 645 square miles, located on the eastern bank of the Illinois River, slightly northwest of the center of the State. It lies between the parallels 40° 20′ and 40° 50′ north latitude, and the meridian 89° 30′ west from Greenwich nearly bisects it. The county lies about equally distant from St. Louis and Chicago, slightly to the west of the line joining the two places. Pekin, a city of over 8,000 inhabitants, is the county seat. It is located on the Illinois River. Besides steamboat connection with St. Louis, several trunk lines afford railroad communication with all parts of the country. Washington, a town of about 1,500 inhabitants, is located in the eastern part of the county, while Delavan, having a population nearly as large, is located in the southern part. Mackinaw, Minier, Morton, and Tremont are smaller towns located in the eastern part of the county. Tazewell County has a total population of about 33,000. Its chief industry is agriculture. (See fig. 13.)

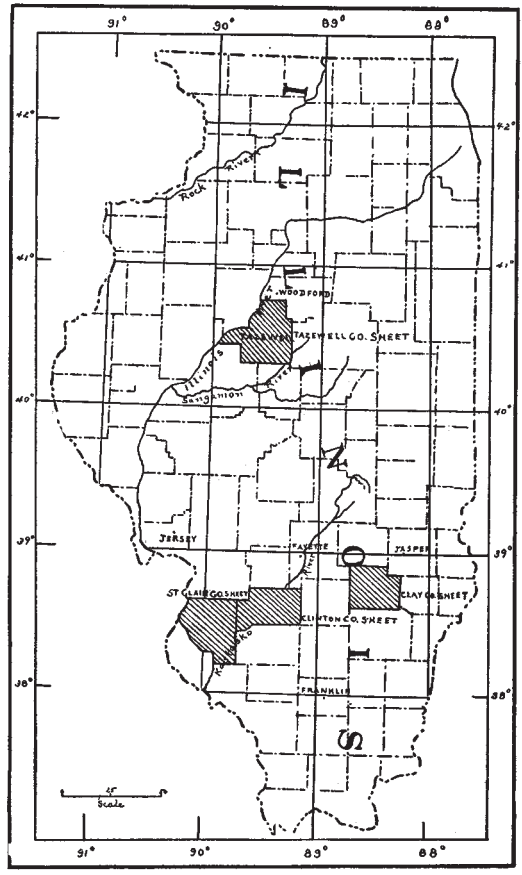

FIG. 13.—Sketch map showing areas surveyed in Illinois

HISTORY OF SETTLEMENT AND AGRICULTURAL DEVELOPMENT.

Tazewell County forms a portion of the Middle West first explored by the French soldiers and priests. La Salle in 1671 passed down the Illinois River to a point near its mouth, making a map of its course and its tributaries. He was followed in 1673 by Marquette, Joliet, and their party, who made use of the Illinois River on their return from the discovery of the headwaters of the Mississippi River. In 1680 La Salle, with Henri Tonti as his lieutenant, began a long series of explorations which accomplished the mapping of the Mississippi River and its tributaries and laid the foundation for French dominion and occupation west of the Allegheny Mountains. Fort Creve Cœur was erected by Tonti near the present site of Wesley, and while only occupied temporarily it formed the first foothold of civilization in this region. At that time the Illinois Indians occupied the banks of the river which still bears their name. They subsisted by hunting, fishing, and the cultivation of small plats of maize. Although the French held this region until 1763, little progress was made in colonization. Only scattered trading posts acknowledged the dominion of France. In 1778 Col. Rogers Clark took possession of the region for the new colonial government, and the Northwest Territory became a part of the State of Virginia. In August, 1778, a combined force of French and Indians was assembled at Wesley. They proceeded to the southern end of Lake Michigan and captured a fortified British post.

The first permanent white settlers of Tazewell County were Nathan Dillon and his brothers, who in 1823 located near the southern end of Tremont Prairie. In 1824 the first log house was built by Jonathan Tharp on the site of Pekin. Soon after, the Tremont and Delavan colonists arrived, bringing improved farm implements. In 1825 the first gristmill, operated by horse or ox power, was erected in Elm Grove Township. Steam navigation began in 1828, all water transportation up to that time having been done by keel boats.

The early settlers were chiefly engaged in agriculture, producing corn, wheat, and oats, and raising cattle. Banks were soon established, schools and churches were organized, and the new country developed rapidly. In 1845 distilleries and breweries furnished a local market for surplus grain. At present the population of the county is chiefly engaged in agriculture. Farm machinery is manufactured in the county, while distilleries, breweries, and a glucose factory afford a local market for grain.

CLIMATE.

The following table, compiled from Weather Bureau records, gives the normal monthly and annual temperature and precipitation at Peoria and Mount Pulaski, no station being located in Tazewell County. Peoria is situated in Peoria County, across the Illinois River and just

north of the area surveyed, and Mount Pulaski lies about 20 miles south of the area.

Mean monthly and annual temperature and precipitation.

Month.	Temperature.		Precipitation.	
	Peoria.	Mount Pulaski.	Peoria.	Mount Pulaski.
	° F.	° F.	*Inches.*	*Inches.*
January	28.5	27.8	2.12	2.26
February	25.4	27.8	1.96	2.27
March	37.7	38.0	3.42	3.05
April	52.6	52.9	1.89	1.98
May	63.1	62.4	4.48	3.69
June	73.6	72.1	3.12	4.04
July	78.0	76.1	2.50	3.49
August	75.3	73.9	2.81	2.54
September	67.1	67.2	4.08	2.91
October	56.9	54.6	2.22	1.82
November	40.3	40.2	1.87	2.56
December	29.1	32.0	1.61	2.01
Year	52.3	52.1	32.06	32.62

The foregoing table gives no idea of the annual extremes of temperature, which are usually within the limits of a maximum of 100° and a minimum of −20° F. Danger from killing frost is generally past by the third week of May, and need not be anticipated in the fall before the latter part of September. This gives a growing season for even the tenderest crops of sixteen weeks' duration. This is long enough to allow the growing of successive crops of many kinds of truck, an industry but little developed at the present time in the area surveyed, but the introduction of which on several important types of soil is recommended elsewhere in this report.

PHYSIOGRAPHY AND GEOLOGY.

The high bluff which forms the eastern boundary of the Illinois River Valley divides Tazewell County into two main physiographic regions. From the northern border of the county southward to the vicinity of Pekin the bluff attains an average elevation of about 200 feet, and a narrow second bottom having an average breadth of about 2 miles intervenes between it and the river. Below Pekin the bluff swings southwestward to the Mackinaw River and becomes gradually lower until it is scarcely noticeable as it descends into the plain southeast of Delavan.

The region to the east of this bluff line consists of a high, rolling plateau, interspersed with broad, level prairies, and deeply trenched through the middle by the Mackinaw River. In the southern part of the county several smaller streams, tributary to the Illinois, have cut

deep, V-shaped gorges that extend back from the bluff line an average distance of 2 or 3 miles and reach out into the uplands through shallow, wooded streams.

The southwestern portion of Tazewell County constitutes an ancient joint flood plain of the Illinois and Mackinaw rivers. It was formed principally as a delta and river terrace deposit during the closing stages of the Glacial epoch. Since the time of its formation the volume of both rivers has been considerably diminished and their level has also changed. In consequence they have both cut minor channels across their old flood plain, leaving it as a second bottom or terrace region. This alluvial plain has been modified further through the drifting of extensive sand dunes across its surface. Several small swamps originally found within this region have been drained naturally or artificially within recent times.

Geologically considered, Tazewell County consists of a basal structure of sandstones and shales belonging to the Upper Carboniferous rocks. The outcrops of these strata are few and scattered, occurring principally in the upper gorges cut through the bluff line by the smaller tributaries of the Illinois River. A 4-foot seam of coal, outcropping near the foot of the bluff, is of considerable economic importance in the development of the region. It is mined on a small scale at several points in the county for the use of railroads and manufacturing establishments. The surface features of the county are entirely formed by the deposits of Pleistocene and recent geologic age.

Tazewell County was invaded by the ice sheets of both the Illinois and Wisconsin glaciation. The former ice sheet extended entirely over the county, while the Wisconsin ice sheet only reached to a limit approximately marked by the principal Illinois River bluff line. That portion of the county lying to the west of this line was occupied during this stage by one of the chief drainage lines of this latest ice invasion. The series of deposits in this territory is therefore alluvial rather than glacial in origin. During the Wisconsin glaciation the older deposits of the Illinois stage were almost entirely overridden and covered up in Tazewell County, either by the Wisconsin till or by the fluvio-glacial deposits formed in the alluvial tracts by marginal drainage from the Wisconsin glacier.

The general section in the glaciated upland is uniform in character, though the thickness of the deposits varies considerably in different parts of the county. The Wisconsin till attains a thickness of from 30 to 60 feet. Below the surface of the soil it consists of a yellowish-gray or dark-drab silty clay of massive structure and uniform texture. A few large bowlders of granite, porphyry, diabase, conglomerate, sandstone, and limestone are scattered over the surface, particularly in the moraine belts; otherwise this till is free from stone, gravel, or coarse sand. It is underlain by about 10 feet of medium loamy sand,

showing local stratification and cross bedding. This rests upon a thin bowlder bed, containing the greater part of the large erratics found in the region. The bowlder bed rests upon a gravelly blue till or bowlder clay of considerable thickness. Near the margin of the bluff the gravelly clay is underlain by a massive bed of gravel and sand that has been cemented into a coarse conglomerate through the deposition of calcium carbonate cement. The carboniferous rocks form the basis upon which this rests. The upland soils are derived entirely from the glacial deposits of the Wisconsin stage.

The general section through the alluvial region is entirely different. Near the bluff line south of Pekin and immediately west of Delavan the surface soil is underlain by a deposit of yellow silt and clay known geologically as the valley loess. At a depth of about 6 feet this grades downward into a fine yellow sand which shows unmistakable evidence of stratification. The sand is only 5 or 6 feet in depth near the eastern border of the alluvial region, but thickens rapidly toward the west on account of the slope of the surface on which it rests. Where its lower limits could be seen it was underlain by a thin seam of gravel, which in turn rested upon the pebbly blue clay of the older glaciation.

The present bottom lands of the Illinois and Mackinaw rivers are formed by recent alluvial deposits of loam and sand mixed with a considerable amount of organic matter, which predominates in some localities to such an extent that typical beds of peat are formed along the margins of the bottoms.

The formation of the sand dunes already mentioned is still in progress, as is also the natural draining of the swamps, the silting up of the bottom lands, and the erosion performed by the minor streams along the bluff line. This constitutes the closing chapter of the geological history of the county.

The alluvial portion of the area is marked by a considerable diversity of soil types in contrast with the uniformity of the upland soils. Eight of the ten soil types of the county are found wholly or in part within the alluvial region, while the entire upland country contains but two principal types, with a third slightly developed along the larger stream courses.

SOILS.

Ten soil types are found within the limits of Tazewell County. These represent variations in the texture, structure, surface configuration, and the drainage of the materials which constitute the surface 4 feet of the area.

The areas occupied by the different soil types in Tazewell County are given in the following table:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Tazewell silt loam	224,960	54.5	Yazoo clay	13,696	3.3
Miami black clay loam	61,184	14.8	Peat	1,664	.5
Miami loam	32,512	7.8	Mackinaw gravel	1,088	.3
Lintonia loam	29,056	7.0	Yazoo sandy loam	128	.....
Delavan silt loam	25,600	6.2	Total	412,864	.....
Miami fine sand	22,976	5.6			

MIAMI FINE SAND.

The Miami fine sand constitutes irregular ridges and hills of medium and fine-grained sand inclosing bowl-shaped or irregular hollows, whose soils consist of a slightly more loamy sand. There is no distinct division between the soil and subsoil of this type. The typical soil, from the surface to a depth of 40 inches, is that of a brown or yellowish sand of fine to coarse grain, made somewhat loamy through the presence of a small amount of fine particles, chiefly silt and clay, together with varying proportions of partially decomposed organic matter. The highest summits of the sand hills and irregular driftlike areas on the sides of the hills frequently consist of incoherent orange or yellow sand. On the windward side of some of the hills small cavernous gashes are found. From these gashes the most recent wind storms have carried away the drifting sand, depositing it in more sheltered positions. No large area is denuded by any one storm, and the points of attack vary from time to time, though the prevailing westerly and northwesterly winds cause a gradual progressive migration of the sand toward the east. The area of deposition usually forms a much larger exposed surface than the area of derivation, for the sand is spread out to a depth of 5 or 6 inches or a foot to the lee of a small pitlike opening, the minor variations in wind direction giving rise to a fan-shaped distribution from a central point.

The greater portion of the Miami fine sand lies in Spring Lake Township, between the Illinois and Mackinaw bottoms. Smaller areas are found in the northwestern part of Cincinnati Township and in Malone Township. The large continuous masses of the higher sand ridges appear along the horizon like miniature mountain ranges, while the low undulations of the smaller sand ridges extend to the eastward of the main mass, forming low outliers that foreshadow the slow advance of the sand hills across the level plains bordering them on the east. The broad valley of the Mackinaw curving southeastward from the mouth of the river through Sand Prairie Township presents an effectual barrier to the slow westward movement of the main mass lying in Spring Lake Township.

A notable peculiarity of the Miami fine sand area is the absence of minor stream drainage. Rain falling upon the sand ridges sinks through the porous mass, and for the most part issues along the cliff lines as subsurface drainage into the Mackinaw and Illinois rivers. A portion of the water derived from torrential downpours accumulates temporarily in the hollows between the surrounding sand hills, but ultimately it finds its outlet by seepage downward, no permanent channels being formed. Aside from the slow accumulation of the sand and silt in the small hollows among the sand hills, erosion, transportation, and deposition are carried on by æolian and not aqueous forces.

The sand which forms these hills, impelled by the wind, has migrated from the low cliffs along the Illinois River and has halted between wind storms at various times in its progress. The advance of the sand across the ancient Mackinaw flood plain has occupied all the immeasurable time since the Mackinaw and Illinois rivers established their present channels. During the thousands of years that have elapsed hills of more than 100 feet in elevation and of several square miles in extent have been piled up and pushed forward across the plain. Where the supply of the sand has been greatest and the sweep of the wind least obstructed the progress has been most continuous and most rapid. The growth of trees and grasses has delayed the migration by diminishing the force of impact of the wind and by holding the soil together with an intricate network of roots and a spongy mat of half-decayed vegetation on and within the soil, ultimately giving rise to the slightly loamy character and brownish color of the less exposed portions of the area.

The Miami fine sand consists of partly rounded grains of quartz stained to a rusty yellow or orange by iron.

The natural growth on this soil consists of scattered and stunted black-jack oak and coarse bunch grass.

Some special adaptation of crops to soil has been undertaken on this type. Small vineyards occupy scattered positions, usually where the slopes are gentle and the soil somewhat loamy through the addition of organic matter by natural causes. Sweet potatoes and watermelons are raised to a limited extent, and a part of the area has been devoted to small orchards of peaches and pears. The main crops produced, however, are those common to the area. Except in seasons of drought, corn and clover produce fair yields. Rye is raised to a greater extent than wheat, and both crops are subordinate to corn.

The Miami fine sand affords an opportunity for the production of special truck crops. Elsewhere on this soil type peaches, cherries, and plums are raised successfully, while small fruits also thrive. Of the truck crops, watermelons, cantaloupes, early tomatoes, eggplants, peppers, early pease, early green corn, and other truck crops could be produced to a greater advantage than any of the grain crops now grown.

In order to furnish nitrogen and organic matter to this sandy soil cowpeas or other leguminous crops should be used both for plowing under and to furnish forage for stock, thus insuring an additional local supply of stable manure.

The following mechanical analysis shows the large proportion of sand in this soil and exhibits the presence of some, though little, organic matter:

Mechanical analysis of Miami fine sand.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
6658	7¾ miles W. of Delavan.	Brown loamy sand, 0 to 40 inches.	0.53	0.10	3.92	22.26	62.20	6.24	2.86	2.42

MIAMI LOAM.

The Miami loam consists of a brown, slightly sandy loam soil about 10 inches in depth. The surface soil is friable, easily worked, free from stones, and generally quite level. It contains about 10 per cent of medium sand. The subsoil has a depth varying between 20 and 40 inches. It consists of a brownish-yellow loam. This immediate subsoil is usually underlain by a reddish gravelly loam. Near the cliff line the gravelly loam is reached at a depth of 30 or 40 inches, while in the central portion of the larger areas the thickness of the soil and subsoil above the gravel band amounts to 8 or 10 feet.

The Miami loam occurs in small areas between the sand hills in Spring Lake and Sand Prairie townships, and is more extensively developed in Cincinnati Township.

The surface of this soil type is almost entirely level or gently undulating. Small strips and hillocks of Miami fine sand are found over the plains of Miami loam, constituting the greatest change of slope found within the type. Slight depressions in the formation are more loamy than the general average of the type because of the accumulation of silt and clay carried in by the heavier rains, and also through the incorporation of partly decayed organic matter, vegetation being of a slightly ranker growth in these depressions.

The Miami loam borders the Mackinaw bottoms on both sides of the river, and the natural drainage of the type is accomplished through the channels of many small streams along the margin of the type. A large part of the precipitation on this formation is drained off by percolation through the underlying gravel and sand.

The Miami loam constitutes the original surface of a delta deposit formed by the Mackinaw River during the closing stages of the Glacial epoch, while the Illinois River occupied a much larger expanse of bottom than it does at present. The materials first deposited consisted of sand, gravel, and silt, brought in by the Mackinaw from its upper courses and piled together in the form of cross-bedded and stratified deposits of sand and gravel. Later the finer surface loam was spread out, forming a level plain. When the surface of the Illinois River had been lowered sufficiently to expose this plain, the Mackinaw was enabled gradually to carve its present bottom lands from the deposits which it had formerly made. The Illinois River also washed the frontal slopes, flowing through the channels which now exist as lakes and sloughs. Here the prominent influence of water ceased and the wind, undercutting the sandy bluffs, began the formation of the dunes and hillocks of sand. As the advance guard of sand hillocks moved across the plain a small portion of the coarser sand lodged behind and became incorporated with the surface soil. The more violent windstorms also distributed occasional small amounts of sand across the plain, and the Miami loam assumed its present slightly sandy character at the surface, though retaining the heavier original loam in the subsoil.

The mineral matter constituting this soil consists of a complex mixture of fine particles collected by the Mackinaw from the glaciated uplands and sorted by the varying velocities of the transporting currents. The finer particles selected and redeposited over the ancient flood plain and delta of the river form the chief portion of the present Miami loam. Since the original source of this material consisted of a heterogeneous mass of disintegrated mineral matter, the resulting soil is more complex than the average of sedimentary deposits. In addition to the siliceous and aluminous body mass of the soil there are present smaller amounts of partly weathered silicates of potash, lime, magnesia, and iron, derived from the igneous rocks transported to the upland from distant localities by glacial ice and hence removed by the Mackinaw drainage to form a portion of the Miami loam. The most striking mineralogical peculiarity of this formation, however, is the presence in the subsoil, and through the gravel underlying it, of large amounts of carbonate of lime. The original source of this lime is the magnesian limestones of northeastern Illinois. The older till of the Illinois glaciation is filled with bowlders, gravel, and fragments of much smaller size formed from the limestone. This material, reworked by the Mackinaw and built into its flood plain, lies at present above the permanent water table and is subject to continual solution and almost immediate redeposition in the form of calcium carbonate cement, formed most extensively in the larger gravel bands of the Mackinaw delta. A considerable amount of this carbonate of lime is being dis-

solved each year and brought into the soil and subsoil of the Miami loam by the capillary circulation of the soil solutions. It forms an essential part of the easily soluble matter present in most of the soil types of the area, and its presence is important, not only as a plant food, but on account of the rôle it plays in maintaining a proper physical condition in the soil and subsoil.

Under the present system of agriculture the Miami loam is farmed in a regular rotation of corn, wheat, oats, and grass. Corn produces from 35 to 50 bushels per acre; wheat, 18 to 25 bushels per acre; oats, 25 to 35 bushels per acre; and grass, about 1 ton of hay per acre.

The Miami loam is best adapted to the production of sugar corn, green peas, and tomatoes for canning purposes. Different varieties of pears—notably the Kieffer—could be grown to advantage. The canning industry would bring larger and more certain returns to the farmers located upon this type than the present system of grain farming, while the fertility of the land could be easily maintained and properly increased through feeding the by-products of the canning factory to the farm stock.

The textural peculiarities of this soil, as shown by the following mechanical analyses, its admirable natural underdrainage, its level surface, and its climatic surroundings, with the adaptation of crops indicated, should cause it to be esteemed of higher value than it has been.

Mechanical analyses of Miami loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
6650	3 miles SW. of Pekin.	Brown sandy loam, 0 to 14 inches.	1.69	3.68	15.40	8.52	11.70	7.74	35.26	18.14
6652	6 miles SW. of Pekin.	Brown sandy loam, 0 to 12 inches.	2.80	1.78	17.20	11.96	5.02	4.04	35.74	24.08
6651	Subsoil of 6650....	Yellow loam, 14 to 30 inches.	1.16	3.74	18.84	9.04	13.14	5.92	29.36	19.82
6653	Subsoil of 6652....	Brown loam, 12 to 28 inches.	1.78	2.22	17.24	14.24	5.88	1.90	33.10	25.36

LINTONIA LOAM.

The Lintonia loam consists of a slightly sandy, though sticky, brown or black loam, having a depth of about 10 inches. It is underlain by a reddish-brown, yellow, or gray silty loam subsoil. The soil contains a considerable proportion of organic matter, and this, together with the fine sand, causes it to become granular and friable when partly dried. Locally small amounts of fine gravel are scattered over the surface,

and in the same manner limited areas contain small concretionary pebbles of hydrated iron oxide (limonite) in the subsoil.

The Lintonia loam is extensively developed in the bottom lands along the Mackinaw River, while small areas occur along the Illinois, near the bluff line south of Pekin, and along the narrow bottoms of streams tributary to the Illinois and Mackinaw rivers. The surface of this soil type lies at an elevation of 10 or 15 feet above the normal water level of the streams which it borders. It is mainly level or only slightly irregular where indented by sloughs or old stream channels, cut during former overflows of the rivers. At the present time it is rarely flooded except by the largest freshets. It is well drained during the crop season by numerous small streams, while its proximity to the river, its low-lying position, and its retentive texture maintain an abundant moisture supply for the production of large crops of corn, wheat, oats, and grass. In addition to the natural drainage, large areas are tile drained. The water table stands at a depth of 4 or 5 feet below the surface.

This soil consists of the recent alluvial deposits of the Mackinaw and Illinois rivers, formed by small annual accumulations of fine sand, silt, and clay, mixed with a large proportion of organic matter. Some areas have been formed by the washing in of silt sediments from the surrounding soils. The marginal parts of this type along the streams are still subject to occasional overflow and to the local accumulation of new material. A small portion of this soil type is included in the artificial drainage area of Spring Lake and Sand Prairie townships.

Near the Mason County line there are many low spots having either a rusty, reddish-brown color or a grayish to ash-colored surface. The red spots are underlain by a yellow, ocherous, clayey subsoil, containing a considerable quantity of iron concretions or "iron gravel." The cultivated fields containing these red spots show a flourishing crop of rye and wheat over the general soil type, while the grain over the red areas is entirely killed out, yellowed, or stunted.

The ash-colored spots show a surface efflorescence, accumulating in some cases sufficiently to form a thin, brittle crust. The wheat and rye over these gray spots continue to grow, though not in as healthy a condition as on the general average of the soil.

Corn yields from 40 to 50 bushels per acre on the average; wheat, 25 bushels; oats, about 40 bushels, and hay from 1 to 1½ tons per acre. On some fields located on this type corn is raised four or five years in succession before the rotation is changed, producing excellent crops each year.

In addition to the grain crops produced on the Lintonia loam, cabbage, onions, cucumbers, and other market-garden crops could be grown to good advantage.

The mechanical analyses of this soil are given below:

Mechanical analyses of Lintonia loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
6640	8 miles SW. of Pekin.	Brown loam, 0 to 15 inches.	2.88	0.44	0.70	1.20	2.40	7.60	72.12	15.20
6636	2¾ miles NW. of Green Valley.	Brown loam, 0 to 18 inches.	3.93	.20	1.16	3.14	18.60	14.76	43.42	18.72
6638	2¾ miles SW. of Pekin.	Brown loam, 0 to 10 inches.	3.36	.12	.46	1.10	6.02	6.84	63.62	21.84
6639	Subsoil of 6638.....	Brown loam, 10 to 30 inches.	2.65	.10	.56	2.60	12.90	11.20	54.38	17.00
6641	Subsoil of 6640.....	Brown loam, 15 to 40 inches.	1.85	.70	2.64	2.80	6.90	8.72	58.52	19.66
6637	Subsoil of 6636.....	Yellow silty clay, 18 to 40 inches.	.57	.40	1.72	3.06	6.90	7.46	57.64	22.56

PEAT.

Along the margin of the Mackinaw bottoms at the foot of the cliffs there are several small areas of peat. The soil consists of a black mass of partly decayed vegetable matter mixed with silt or clay. It forms a spongy, incoherent mass, extending to varying depths. Near the margins the proportion of organic matter is diminished and the depth of the deposit decreases to 3 or 4 feet. Near the center of the areas the peat has accumulated in its greatest purity to a depth of 10 or 15 feet. It is underlain by medium-sized white gravel and grayish sand. The surface of the peat is almost level and its drainage has been accomplished by artificial ditches, which are cut almost or entirely through the mass to the underlying gravel.

This peat has been formed through the agency of large springs that form the outlet of the subsurface drainage of the adjoining alluvial plain. The springs reach the surface both along the cliff line and through the gravel bed which underlies the peat. The sediments deposited by the Mackinaw River have been built up during recent times along the present stream channels, leaving low hollows near the cliffs in which the spring water has accumulated. These pools have gradually grown up to water grasses and moss, and this vegetation decaying has accumulated to form the peat beds. The rain wash from the cliff slopes and the encroachment of the Mackinaw sediments in times of overflow have furnished the mineral matter which enters into the composition of the mass.

Until the drainage ditches which have reclaimed this area were cut,

the water table reached the surface of the soil. The ditches have lowered the level of permanent saturation to a depth of 4 or 5 feet, and the peat is now cultivated to corn, wheat, oats, and grass. The average yield of corn is from 35 to 40 bushels per acre; that of wheat, about 20 bushels; oats, 30 to 35 bushels, and grass about 1 ton per acre. Some celery has been cultivated on this soil. The peat is too tender to support the weight of a large corn crop against strong winds, and the surface is apt to catch fire when the refuse and stubble of a former crop are burned off.

The peat areas in Tazewell County present an excellent opportunity for the production of celery and onions—two crops which have been raised upon peat soils with marked success in other areas. The labor attending the cultivation of these crops is much greater than that involved in grain production, but the crop value per acre is also much greater.

DELAVAN SILT LOAM.

The Delavan silt loam consists of a silty and fine sandy loam that maintains its characteristic texture and color to a depth varying from 18 to 30 inches. Down to the plow sole, a depth of about 6 inches, this soil is massive and homogeneous. Below this depth to the limit of the surface soil the mass is somewhat more friable and loamy. The surface soil is underlain by a deep-reddish or yellowish-brown silty subsoil of a heavier texture than the surface soil. It grades imperceptibly into the characteristic yellow silt loam, known geologically as valley loess. Natural stream cuts, wells, and railway excavations show that this loess grades downward into a fine, stratified yellow sand and that the entire mass rests upon the pebbly till of the Illinois glaciation. The complete section differs materially from that of the Tazewell silt loam given elsewhere, and with the physiographic differences forms the most constant and easily recognized basis for discrimination between the two types.

The Delavan silt loam comprises the higher lying portion of a level plain immediately to the west of the glaciated upland of the county. With the exception of narrow strips along the Mackinaw River and along the Illinois bluffs near Pekin and Circleville, the Delavan silt loam occupies a solid block of territory in Delavan, Malone, and Sand Prairie townships.

The surface of this soil type is uniformly level, forming a broad expanse of low prairie. No deep stream valleys have been cut into this type except where the Mackinaw has divided off the northern portions of the area. The minor streams occupy low swales, chiefly distinguishable from the average of the type through the greater depth of surface soil and the accumulation of a little more organic matter. Where the Delavan silt loam laps against the Tazewell silt loam, south of

the Mackinaw River, there is frequently found a slight depression containing a deeper, darker soil like that along the minor streams.

The natural drainage of this soil type is accomplished in part by the larger secondary streams, such as Big Crane Creek, and in part through the excellent underdrainage effected by the sand stratum below the loess. Tile drainage is rarely employed, surface ditches usually proving adequate for the disposal of surplus water.

The valley loess, from which this soil is derived, is believed to be a semiæolian, semilacustrine sediment formed by the deposition in the ponded waters of glacial streams of fine silt and clay particles carried into them from the surface of the receding glacial ice both by air and water currents. The limited portion of the valley loess studied in Tazewell County, while sufficiently characteristic to admit of thorough identification, is not extensive enough to form the basis of a theoretical consideration of the origin and relationships of this perplexing geological body. The immediate subsoils of both the Delavan and Tazewell silt loams are almost identical in texture, but, as has been indicated, the complete section to a depth of 15 or 20 feet differs materially. It is probable that the silty subsoil of the Delavan silt loam represents a reworked and redeposited fluvial phase of the Wisconsin till, which forms the deeper subsoil of the Tazewell silt loam.

The varied mineral constituents of the Delavan silt loam consist of finely divided and partly decomposed minerals brought into the area through glacial agencies from a number of sources and finally deposited in their present position through the intervention of river and lake conditions accompanying the closing stages of the Glacial epoch. It is a common characteristic of such deposits that the mineral matter composing them has not been so thoroughly decomposed chemically as that of residual soils, nor so thoroughly washed out and reduced to the state of chemical and mechanical simplicity as is the case with marine sediments. As a result, soils derived from glacial and loessial materials are apt to present, other things being equal, a favorable opportunity for the further preparation of plant food, because further decomposition of the silicate minerals present can render available various soluble compounds of the potash, lime, magnesia, and alumina occurring in these minerals. Soils derived from the loess are in consequence found to be well supplied with the mineral elements which enter into plant growth. In the case of the Delavan silt loam there is also present a good supply of organic matter, which helps to form a fertile and durable soil. The additional characteristics of a surface suited to easy cultivation and of good natural underdrainage have tended to render this soil type one of the most productive of the area.

The Delavan silt loam has been under cultivation since the early settlement of the county. Various fields have constantly produced crops of grass and grain considerably in excess of the average yield

of the county and State. The fields have rarely been replenished by the addition of any form of fertilizer other than the feeding of stock on limited tracts. The average production of this type ranges from 35 to 50 bushels of corn per acre, 18 to 25 bushels of wheat, 35 to 40 bushels of oats, and about 1½ tons of mixed timothy and clover hay. During favorable seasons these yields are not uncommonly exceeded. As an evidence of the fertility of this soil, it may be stated that from 6 to 10 corn crops have been harvested in succession from single fields without fertilization and without noticeable diminution of the yield.

No change of crop adaptation need be suggested beyond the opinion that the feeding of more stock upon the farms located on this type would insure the maintenance of its present state of fertility for a long period of time.

The following mechanical analyses show the average texture of this soil type:

Mechanical analyses of Delavan silt loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.5 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
6632	2 miles SW. of Delavan.	Brown silty loam, 0 to 18 inches.	3.00	0.30	0.90	0.72	0.98	8.86	69.42	18.82
6634	2½ miles SW. of Green Valley.	Brown silty loam, 0 to 26 inches.	2.44	.26	1.20	.40	.80	5.04	69.26	22.74
6633	Subsoil of 6632.....	Yellow silty clay, 18 to 40 inches.	.55	.10	.56	.42	2.70	13.02	73.22	9.56
6635	Subsoil of 6634.....	Yellow silty clay, 26 to 40 inches.	.46	Tr.	1.00	.30	.74	6.90	75.82	15.08

MACKINAW GRAVEL.

The Mackinaw gravel consists of a gravelly soil and subsoil formed by the outcrops of pebble bands along the high bluffs of the Illinois River and along the margin of the Miami loam in the southwestern part of Tazewell County. This type consists of from 35 to 60 per cent of rounded or subangular gravel of glacial material of various sizes. The great majority of the pebbles are less than 2 inches in diameter. The fine earth mixed with the pebbles consists of sand and clay along the Illinois bluff and of a light sandy loam in the southwestern part of the county. This soil type is only found along the steep slopes where the glacial or alluvial gravels reach the surface and are carried down the slopes by rain wash and by active erosion.

The steep cliffs along the Illinois River above Pekin constitute the chief area occupied by this gravel. The low cliffs in Spring Lake

Township give rise to only narrow bands of gravel, relatively unimportant. In the northern part of the county the more gently sloping portions of the cliffs are cultivated to various crops or maintained in pasture. Near the Woodford County line a few small vineyards are found on this type.

These areas should either be cultivated in vineyards or orchards or else reforested, as the continued plowing of the steeper slopes not only increases the erosion over this soil, but also enables the minor streams to cut their gorges back into the upland fields. The formation of permanent horizontal rows attendant on vineyard or orchard culture would reduce the rain wash to a minimum, while allowing the use of the land.

This type is for the most part uncultivated, as it has slight value for general farming. It might be adapted to grapes and peaches.

No mechanical analysis of this soil is given, since, aside from the large content of gravel, its fine-earth constituents are extremely variable.

YAZOO CLAY.

The Yazoo clay consists of a heavy drab clay loam, having a depth of 5 inches. This is underlain to a depth of 40 inches or more by a sticky yellowish clay. Below a depth of 5 or 6 feet there are found local veins of grayish sand.

In Tazewell County this soil type only occurs along the Illinois River bottoms. Its surface is very level, and is only indented by shallow sloughs and lake basins. Owing to the existing conditions, the Yazoo clay is inundated to a depth varying from 3 to 10 feet from December until the latter part of May. During the remainder of the year the surface is above water, but the subsoil is saturated below a depth of 2 feet.

The Yazoo clay consists of the finer sediments which are being deposited at the present time by the river, mingled with organic matter from vegetation growing in the bottoms. Very little of the Yazoo clay is under cultivation. The natural forest growth consists of elm, water maple, and a few scattered oaks and pecans. There is little underbrush, and the forest is open.

In order to render this soil available for agricultural purposes an extensive system of dikes and ditches must be constructed. The timber is not of sufficient value to pay for the clearing of the land. In the latitude of Tazewell County this soil is better adapted to wheat than to any other crop. The higher lying areas can be cultivated to spring wheat without recourse to extensive diking and ditching. Tile draining would not be necessary, since on exposure to the sun the surface cracks to a fine, granular "buckshot" condition, allowing the soil to a depth of 12 inches to become thoroughly drained.

The area of Yazoo clay found in Tazewell County would amply repay the expenditure necessary to reclaim it.

The following mechanical analyses show the texture of this type:

Mechanical analyses of Yazoo clay.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
6668	18 miles SW. of Pekin.	Drab clay, 0 to 9 inches.	1.55	0.14	0.80	1.32	6.60	10.06	52.32	28.74
6669	Subsoil of 6668.....	Drab clay, 9 to 30 inches.	1.45	.48	1.20	1.52	12.96	19.40	44.58	19.68

YAZOO SANDY LOAM.

The surface 6 inches of Yazoo sandy loam consists of a fine yellow sand that is loose and friable when dry and packs to a compact surface when wet. It is underlain by a somewhat loamy yellow sand, extending to a depth of over 40 inches.

The entire area of Yazoo sandy loam in Tazewell County consists of about 96 acres, lying in the Illinois bottoms near Spring Lake. It comprises a bar of sandier material lying a little above the general level of the Illinois bottoms. This soil produces about 40 bushels of corn to the acre.

No analysis of this type is given, on account of its limited extent.

TAZEWELL SILT LOAM.

The soil of the Tazewell silt loam consists of a brown or gray silt loam containing some very fine sand and a small amount of clay. It has an average depth of from 16 to 18 inches. The soil grades down into a reddish-yellow subsoil, which becomes a lighter lemon color, sometimes mottled with gray, below 30 inches from the surface. The subsoil is a homogeneous mass of very fine sand, silt, and clay. There is much more clay present in the subsoil than in the soil. For this reason the subsoil is frequently known as yellow clay or yellow hardpan.

The Tazewell silt loam occupies the greater proportion of the upland region of Tazewell County. It is not found at any place in the alluvial area.

The surface of the Tazewell silt loam varies from a nearly level plain to a gently undulating or high-rolling upland. This type follows two moraine belts of the Wisconsin glaciation. One of these coincides

approximately with the bluff line which extends from southwest to southeast across the county. The other crosses the extreme northeastern portion of the county. The highest crests of the moraines reach an altitude of about 350 feet above the Illinois River. They converge in the northern part of the county and diverge near the Mackinaw River, forming a broad, shallow depression. The Tazewell silt loam not only occupies the eastern area of the two moraine belts, but it descends their flanks toward the interior prairie country. It also occurs immediately along the banks of all of the major streams. It thus includes not only the greater proportion of the old upland timber belts, but also the higher hills encountered through the treeless prairie.

The natural surface drainage of the Tazewell silt loam is thoroughly established, with the minor exception of a few kettle holes located near the crest of the eastern moraine belt. The larger streams—chief among them the Mackinaw—have cut U-shaped valleys through the till. The wall slopes are steep and mark a sharp angle, not only with the upland, but also with the flat bottom lands. The streams in the northeastern part of the county form an exception to this rule. The steep slope from the crest of the bluff to the Illinois bottoms has allowed more active stream erosion and narrow V-shaped gashes have been cut.

The tilled lands of the Tazewell silt loam have been pretty generally underdrained by the use of tiling. This involves an expense of about $10 per acre.

The Tazewell silt loam has been derived, through the ordinary processes of weathering, from the low moraine hills and in part from the intervening till plains of the Wisconsin drift. Previously to the Wisconsin ice invasion this material formed a part of the surface of northern Illinois and Wisconsin and upper Michigan. It probably existed as glacial material deposited by earlier glaciation and as partly disintegrated rock. The glacial ice in its southward movement carried this material slowly to its present position, and after the accumulation of the Wisconsin glaciation the melting of the ice left behind a partly assorted mass of silt and clay, through which was scattered a great variety of erratic bowlders. Where the ice front halted through the stages of the retreat, this mass accumulated in the form of low hills known as a terminal moraine. At such points the bowlders are more numerous than elsewhere. The intervening till plains are built up more largely of the fine material carried within and under the ice, though some of the surface represents the accumulation of fine sediment borne by the water formed by the surface melting of the glacier.

This material forms a homogenous mass of partly decomposed mineral matter. Particles of quartz, of several varieties of feldspar, of mica, of hornblende, magnetite, and other minerals can be recognized

with the microscope. The angular form of the minerals indicates that they have been reduced to their present fineness largely through mechanical crushing, rather than by chemical decomposition. All of the minerals are partly decomposed, but they still contain large amounts of lime, potash, and magnesia, which can be liberated slowly by progressive weathering to furnish a long-continued supply of the mineral elements necessary for plant growth. Thorough drainage and the use of stable manure will not only increase the fertility of the glacial soils by their direct action, but will also aid in the preparation of these minerals for plant use.

Corn, wheat, oats, and grass are the chief crops grown on the Tazewell silt loam. The yields vary considerably in different parts of the type. This is due in part to the variation in amount of organic matter found in the surface soil, but more largely to greater or less efficiency of cultivation. The best method of cultivation on this type is that which best preserves the organic matter already present, restores it where it has been lost, or furnishes it where it is naturally deficient. Narrow strips of this type located near the larger stream courses are particularly deficient in organic matter. The surface soil on such areas is more yellow and the depth to the subsoil is less than on the larger portions of the type. When cleared of their timber, these strips become naturally sodded over with blue grass, forming excellent pasturage. They also furnish desirable locations for the cultivation of orchard fruits. By careful farming, which should include stock raising and orcharding, this part of the Tazewell silt loam may be made as valuable as the great body of the type.

The present average yield of the Tazewell silt loam is from 40 to 60 bushels of corn, 20 to 25 bushels of wheat, 40 to 50 bushels of oats, and 1 to 1½ tons of hay per acre. With the exception of a small acreage of rye and barley, few other crops are produced on this soil. Nearly every homestead possesses a small orchard of different fruit trees, and numerous small vineyards have been set out. With the exception of one extensive orchard in the eastern part of the county, no systematic attempt has been made to derive any large part of the farm profits from fruit culture. The soil and climate are adapted to apples, pears, plums, cherries, grapes, and small fruits. A good sod is easily established, which prevents the soil from washing and which would promote a profitable dairy industry.

The following mechanical analyses show the physical characteristics of this soil type:

Mechanical analyses of Tazewell silt loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
6662	1½ miles SE. of Pekin.	Brown silty loam, 0 to 8 inches.	2.21	0.70	1.80	0.60	0.76	5.34	75.84	14.72
6664	3 miles N. of Mackinaw.	Gray silty loam, 0 to 10 inches.	2.23	.20	.66	.52	.88	1.94	80.58	15.04
6660	1¼ miles NE. of Groveland.	Brown silty loam, 0 to 10 inches.	4.55	.72	1.30	.70	.86	2.04	76.00	18.20
6666	3¼ miles S. of Washington.	Brown silty loam, 0 to 16 inches.	2.70	.20	.54	.36	.52	1.74	70.04	26.44
6663	Subsoil of 6662.....	Yellow silty clay loam, 8 to 40 inches.	.49	.64	.96	.48	.70	7.26	72.56	17.38
6667	Subsoil of 6666.....	Yellow silty clay, 16 to 36 inches.	.80	.00	.54	.34	.72	1.54	75.08	21.76
6661	Subsoil of 6660.....	Yellow silty clay, 10 to 40 inches.	1.35	.50	.90	.50	.56	2.20	68.78	26.24
6665	Subsoil of 6664.....	Yellow clay loam, 10 to 36 inches.	.39	.00	.66	.28	.60	1.28	70.24	26.86

MIAMI BLACK CLAY LOAM.

The Miami black clay loam has a surface soil 20 inches or more in depth which consists of a sticky combination of clay, silt, and organic matter. When wet it is almost jet black in color, but the immediate surface on drying becomes gray or brown. The characteristic color is due to the presence of organic matter. Below 20 inches in depth the subsoil consists of a drab or yellowish clay, which is even more sticky and plastic than the soil. To a depth of 6 inches the surface soil is slightly granular and possesses a minute cubical structure.

The Miami black clay loam occupies the lower, more level areas through the central part of the till plain bounded on either side by the rolling moraine belts. The surface is nearly level or slightly hollowed out between ridges of the Tazewell silt loam.

A phase of this type having a blue clay subsoil coincides with an old swamp area that has been reclaimed through the construction of drainage ditches under the operation of the Illinois drainage laws. It represents a part of the territory which immediately after the close of the glacial period was occupied by a shallow lake. Into this lake the finer sediments were washed until it became so shallow that the marsh grasses secured a foothold. During this time the natural drainage of the country was becoming established, and the lake was transformed

into a swamp by the cutting down of its natural outlet and by slow sedimentation around the margin. As a result a very homogeneous soil was formed, containing a considerable amount of organic matter mingled with the fine mineral detritus. At the time when the region was first occupied by settlers, other soil types could be brought under cultivation more readily than this swamp area, and its reclamation was only accomplished recently.

The headwaters of the few minor streams which drain the Miami black clay loam soil type occupy slight sags which resemble irregular artificial ditches rather than definite stream valleys. The natural drainage was poorly established or entirely lacking, and the Miami black clay loam has been brought under cultivation by extensive systems of drainage. No portion of the type is at present swampy or undrained.

This soil type owes its existence to the presence in this region of a series of recessional moraines between which a level floor of glacial till has caught the drainage and wash of the higher lands. As a result the finer sediments, chiefly clay, have slowly accumulated. The poorly established drainage failed to carry off excessive rainfall. Rank vegetation flourished during the dryer portions of the year and became intimately mingled with the fine sediments washed in from the surrounding hills during periods of considerable precipitation. At the time when the country was first settled the Miami black clay loam had but recently reached the final stage of soil formation. Its surface was covered by an abundant growth of prairie grass, though the moist condition of the soil and the annual prairie fires had prevented the trees from getting a foothold. As soon as cultivation had begun over the more rolling country, the idea of fertility commonly connected with black soils led to efforts for the utilization of this type. Its subjugation proved easy and the luxuriant growth of prairie grass was soon replaced by broad fields of corn and wheat. Further experience proved that this soil was eminently fitted for the production of corn, and this fact, together with the favorable climatic conditions, largely molded the course of agricultural development throughout the general region.

Corn is the principal crop raised on this type. Its average yield is between 50 and 60 bushels per acre, while the maximum crop attained is not uncommonly above 90 bushels per acre. Oats, wheat, and clover are subordinate crops in the rotation, producing yields somewhat above the general average of the county. Many fields located on this soil type have been cultivated for fifty years without the systematic addition of fertilizers and without any appreciable decrease in the amount of grain harvested. It would be difficult to suggest any crop better suited to this soil than corn or any soil better adapted to the production of corn than the Miami black clay loam.

The following mechanical analyses of representative samples of this type give a clear idea of its texture:

Mechanical analyses of Miami black clay loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
6648	1¼ miles N. of Minier.	Black clay loam, 0 to 18 inches.	4.69	0.20	0.76	0.52	1.26	3.46	74.20	19.54
6644	1½ miles NE. of Tremont.	Black clay loam, 0 to 20 inches.	3.37	Tr.	.20	.20	1.10	5.32	72.44	20.64
6646	¾ mile SW. of Morton.	Black clay loam, 0 to 24 inches.	2.95	Tr.	.40	.26	.76	5.10	72.02	21.38
6647	Subsoil of 6646.....	Yellow silty clay, 24 to 40 inches.	.76	.12	.54	.14	.66	5.34	77.64	15.40
6645	Subsoil of 6644.....	Yellow and blue clay, 20 to 40 inches.	1.80	Tr.	.20	.34	.60	4.40	76.26	17.94
6649	Subsoil of 6648.....	Yellow silty clay, 18 to 36 inches.	1.67	Tr.	.70	.44	.98	3.76	75.68	18.32

DRAINAGE.

The Miami black clay loam and the Tazewell silt loam are generally underdrained by tile. Much more tiling is used on the former type than on the latter. The Miami black clay loam was brought under cultivation before tile drain came into general use, and open ditches were first employed to remove the excess of water. Later many of the tile-drain systems were laid in these ditches and covered. At present most of the farms located on this type are artificially underdrained. The use of the drain is not so general on the Tazewell silt loam, only parts of the various farms being treated.

In Spring Lake and Cincinnati townships an extensive open-ditch drainage system has been installed, draining the lower-lying areas of the Lintonia loam and the Peat. These ditches are from 24 to 30 feet wide at the top and from 8 to 10 feet deep. The system was constructed by a company which comprised as its stockholders the owners of the land to be benefited. This company constructed its own dredge boat, hired the workmen, and ran the drainage ditches at a cost of $12 per acre for excavation. A small acreage assessment is levied for the maintenance of the system. The original cost of the drainage has been more than offset by the increase in the value of the land. The peat land is at present used for the production of the ordinary crops of the region. The yields, while fair and ample to justify the expense of drainage, do not bring as good returns as could be secured from celery and onions.

Similar areas situated more remote from markets are producing celery crops that range in value from $125 to $200 per acre annually, while the land is valued at from $300 to $400 per acre. This industry should be developed in the Tazewell County peat area.

A similar drainage system has reclaimed the large area occupied by the Miami black clay loam in southern Malone and Delavan townships. The expense in this case amounted to about $15 per acre and the value of the land affected has risen from a very low figure to $100 per acre.

Large tracts of land lying in the Illinois River bottoms still await drainage and diking operations to bring them under cultivation. The fertility of these lands is as great as that of any in the region, and though the expense of draining them will be greater than in the other instances the operations would be fully justified by the crop returns.

AGRICULTURAL CONDITIONS.

With the exception of a few square miles in the southwestern portion of Tazewell County, nearly every foot of the surface of this county not occupied by a town site is used for some agricultural purpose. Probably 80 per cent of the area is actually tilled, while the remaining 20 per cent, including the wooded stream bottoms and slopes, is used for pasture. The value of the farms varies considerably. Few farms located upon the Miami black clay loam or Delavan silt loam can be purchased for less than $125 per acre. On the Tazewell silt loam there is a greater range in price, but this is due in part to variations in the amount of improvement and greater specialization in farm products. This is true of other soil types, and it is believed that some of the soils at present held in least esteem could be made to exceed the present average value of the farm lands of the county by a more careful specialization in crops leading to an intensive system of cultivation. In general, the farm lands of the county are paying a good rate of interest upon their valuation, and they are considered a good security for loans by private persons and the local financial institutions.

The farm tenure varies in the different parts of the county. Probably more than 50 per cent of the farm land is occupied by the owner, while the remainder is held in long tenure by tenants who sooner or later expect to become owners of land within the county. Part of the tenant farms are leased for a cash rental, but the majority are worked on shares, 50 per cent to the owner and 50 per cent to the tenant being the usual basis. Other ratios are arranged, depending upon the amount of stock, implements, or seed furnished by the parties to the agreement. This arrangement is sufficiently satisfactory to secure a high class of tenants, experienced in cultivation and only lacking the capital necessary for the original purchase of the land they occupy.

The farms vary greatly in size. The quarter-section farm is com-

mon, while farms comprising less than 80 acres are rare. Several proprietors own separate farms aggregating 1,500 acres or more. The average size of the Tazewell County farm is 125 acres.

The smaller farms are operated by the owner and his family, assisted during the press of work by daily or monthly labor, frequently performed through cooperation with neighbors. The larger farms are operated by the owners or a tenant in charge, who hires additional help by the year. The farm laborer, if married, usually occupies a neat tenant house. The younger, unmarried men secure board on the place or live at home. The greater part of the cultivation of the farm is done by horsepower, the level, gravel-free character of the soil giving horse machinery its greatest efficiency. Four-horse teams are usually employed in operating gang plows, disk harrows, grain drills, and force seeders. The cultivating is done with two-horse teams and wheel cultivators. The grain is thrashed and corn shelled by steam power, though some horsepower shellers are employed. In some cases thrashing associations are formed, a group of farmers owning the power machinery, which owners and tenants operate for exchange of labor.

Corn forms the basis of Tazewell County agriculture. Climatic and soil conditions favorable to this crop, coupled with the proximity of the Chicago market, have tended to this development. Oats occupy a second place among the grains. Clover and timothy hay are third in importance among farm crops. Wheat and rye, though raised, are of subordinate importance. Nearly every farm possesses a small orchard of apples, pears, and plums, while grapes and small fruits have been cultivated for home consumption during recent years. No large proportion of the fruit crop is sold outside the county. Small quantities of watermelons, sweet potatoes, and celery are raised in the southwestern portion of the county.

The existence of but two principal soil types upon the uplands, both well adapted to grain production, has led to the system of extensive rather than intensive farming which dominates the entire county. In consequence, although ten soil types are found in Tazewell County, the crop rotation practiced upon all is nearly identical. Two or more crops of corn are harvested before oats are sown as the next member of the rotation. With the oats clover is seeded. After one crop has been cut timothy is sown with the clover, and when that has been cut the sod land is again plowed for corn. The only adaptation of soils to a special crop is found where small tracts of the peat soil are producing celery and where the Miami fine sand is occasionally used for watermelons and sweet potatoes. The Tazewell silt loam and the Delavan silt loam are the only soils employed to any extent for dairying and stock raising.

The Illinois River is navigable above the northern limit of Tazewell

County. Freight and passenger steamers run to St. Louis, with landings at Peoria and Pekin.

The county is well supplied with facilities for railroad transportation. The Chicago, Peoria and St. Louis, Chicago and Alton, Illinois Central, Lake Erie and Western, the Vandalia Line, the Big Four, and other trunk or branch railroads give communication with Chicago, St. Louis, and points east and west.

The highways of Tazewell County consist of dirt roads, chiefly laid out according to the Government land surveys along the section lines. The bluffs along the Illinois and Mackinaw rivers have necessitated some adjustment of grade to topography. Elsewhere the surface is so level that the rectangular road system is the rule. The roads are constructed by grading up the local material into turnpike form. Some road drainage is attempted, and a few miles of highway in Washington and Fond du Lac townships have been surfaced with gravel. The glacial gravel, which outcrops abundantly along the Illinois bluffs, and to a less degree along the Mackinaw and minor streams, constitutes an admirable material for surfacing the natural clay or loam roads of Tazewell County. In many instances the hauling distance from the gravel pit is slight, while in all cases the improvement of the road from the use of this gravel would be great. The taxable valuation of the land is sufficient to warrant a considerable expenditure for the improvement of the roads of the county.

Pekin and Peoria furnish the chief local markets for the farm products of Tazewell County. The distilleries, breweries, and glucose factories located at these points furnish a local demand for grain. The great proportion of the crop, however, is shipped from many small elevators along the principal railroads to the great central market at Chicago. The live stock is chiefly sent to the same place. Dairy products are either sold locally or in Peoria and Pekin. A considerable part of the butter, poultry, meats, and early vegetables used in the county is imported from outside.

The ease with which the grain crops can be cultivated has led to the adoption of a system of agriculture which is not self-supporting. The grain is continually sold from the field and a minimum amount of live stock fed in the region to restore the elements of plant food to the soils. The great natural fertility of the soils of the area has, so far, offset the tendency toward deterioration, and has established a false confidence in the advisability of this system of agriculture. It is probable that the present system might be continued beyond the limit of the lives of the present cultivators with only a slow decrease in the fertility of the soil. On the other hand, the course of agriculture in foreign countries and in the eastern part of the United States has shown that under this system the crop yields must gradually dwindle, and the same experience has shown that the fertility of any soil is much more easily maintained than restored.

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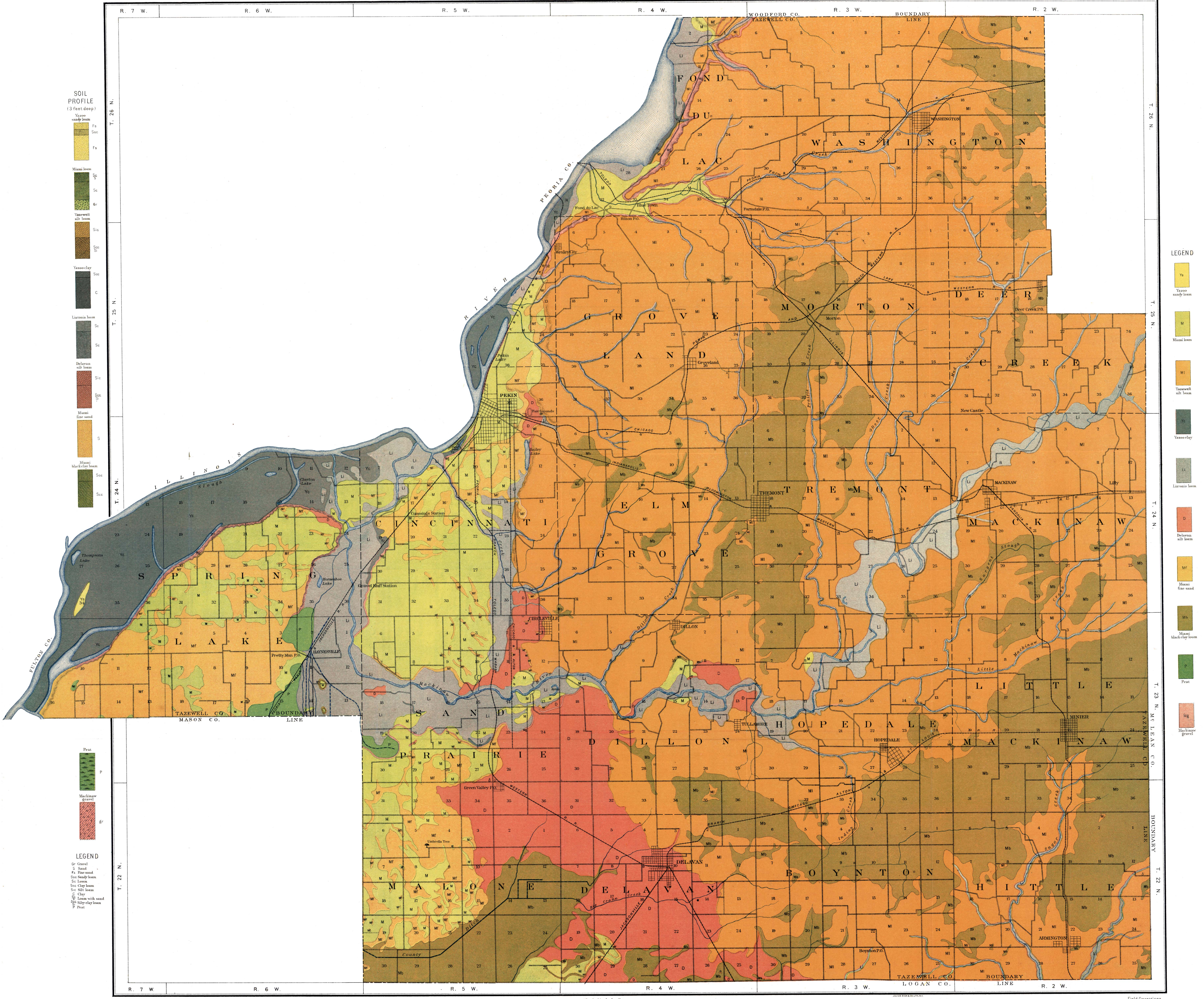
BUREAU OF SOILS
MILTON WHITNEY, CHIEF.

ILLINOIS
TAZEWELL CO. SHEET

DEPARTMENT OF AGRONOMY AND CHEMISTRY
C.C. HOPKINS CHIEF



SOIL PROFILE (3 feet deep)
Yazoo sandy loam
Miami loam
Tazewell silt loam
Yazoo clay
Lintonia loam
Delavan silt loam
Miami fine sand
Miami black clay loam
Peat
Mackinaw gravel
LEGEND
Gr Gravel
S Sand
Fs Fine sand
Ssc Sandy loam
Sc Loam
Scc Clay loam
Sic Silt loam
C Clay
Loam with sand
Silty clay loam
P Peat
LEGEND
Ys Yazoo sandy loam
M Miami loam
Ml Tazewell silt loam
Yc Yazoo clay
Li Lintonia loam
D Delavan silt loam
Mf Miami fine sand
Mb Miami black clay loam
P Peat
Mg Mackinaw gravel
R. 7 W.
R. 6 W.
R. 5 W.
R. 4 W.
R. 3 W.
R. 2 W.
T. 26 N.
T. 25 N.
T. 24 N.
T. 23 N.
T. 22 N.
WOODFORD CO.
TAZEWELL CO.
BOUNDARY LINE
PEORIA CO.
FULTON CO.
MASON CO.
LOGAN CO.
Mc LEAN CO.
ILLINOIS RIVER
FOND DU LAC
WASHINGTON
GROVELAND
MORTON
DEER CREEK
CINCINNATI
ELM GROVE
TREMONT
MACKINAW
SPRING LAKE
SAND PRAIRIE
DILLON
HOPEDALE
LITTLE MACKINAW
MALONE
DELAVAN
BOYNTON
HITTLE
PEKIN
Washington
Morton
Tremont
Mackinaw
Minier
Hopedale
Delavan
Armington
Groveland
Dillon
Circleville
Tullamore
Haynesville
Wesley City
Fond du Lac
Deer Creek P.O.
New Castle
Lilly
Boynton P.O.
Green Valley P.O.
Pretty Man P.O.
Cummings Station
Gravel Bluff Station
Umbrella Tree
Clayton Lake
Thompsons Lake
Pekin Lake
Scale 1 inch = 1 mile

Soils Surveyed by
Jay A. Bonsteel, Geo. N. Coffee
R.C. Lloyd and W.H. Knox
1902

Field Operations
Bureau of Soils
1902